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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,303	12/11/2000	Martin Schadt	08130.0058	7024
22852	7590	07/06/2004	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 1300 I STREET, NW WASHINGTON, DC 20005			HON, SOW FUN	
			ART UNIT	PAPER NUMBER
			1772	

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/719,303

Applicant(s)

SCHADT ET AL.

Examiner

Sow-Fun Hon

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

***Withdrawn Rejections***

1. The 35 U.S.C. 102(b) and 103(a) rejections have been withdrawn due to Applicant's amendment dated 03/29/04.

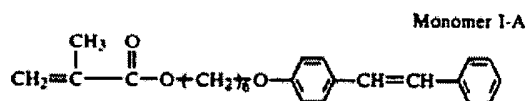
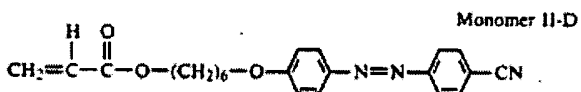
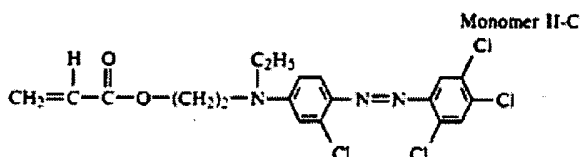
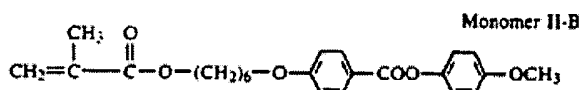
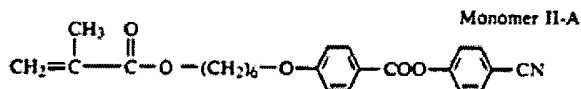
***New Rejections***

***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1-7, 11, 16-17, 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Omelis et al. (previously cited US 5,098,975), as evidenced by Hikmet (US 5,262,882).

Regarding claims 1, 5-6, Omelis et al. has a polymerisable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups (stilbene monomer I-A) and (ii) a photo-orientable monomer (dye monomer II-A) (column 12, lines 55-65). As seen on the next page, the stilbene group is liquid crystalline (mesogenous) with the two vinylic double bonds providing the cross-linkable groups in monomer I-A (column 2, lines 55-65), and the azobenzene linking group provides the cis-trans isomerizable photo-orientable group (claim 5) for the azo dye monomer (column 6, lines 10-25) (claims 6) which is monomer II-C.

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Monomers of Formula I:Monomers of Formula II:

Regarding claim 7, the left segment of monomer II-C has a vinylic acrylate group which makes it linearly photo-polymerisable (column 3, lines 55-65).

Regarding claim 11, the left segments of the monomers above are acrylates.

Regarding claims 2-4, component (i) (crosslinkable liquid crystal (mesogenous monomer I-A) is present in the amount of 100 parts by weight (148 g normalized to 100). Component (ii) (photo-orientable monomer II-A) is present in the amount of 1.7 parts by weight (2.6 g adjusted with the amount of monomer I-A normalized to 100) which is within the claimed range of at least 0.1 part by weight (claim 2), and at least 1 part by weight (claim 3). The claimed range of at least 10 parts by weight (claim 4) is the result of routine experimentation from the recitation of 26 ml dye monomer II-A (column 12, lines 60-65).

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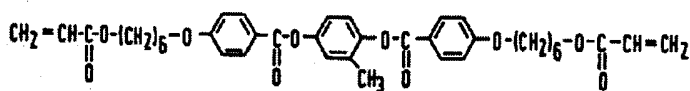
Regarding claim 16, the mixture is dissolved in a solvent (dioxane) (column 12, lines 60-70).

Regarding claim 17, the azo dye molecule makes the film precursor presensitized to light, and is carried by a substrate (column 10, lines 1-5).

Regarding claims 19-20, the polymerized (poly) film produced is optically anisotropic, used for optical components (column 1, lines 5-15).

Regarding claim 1, Omelis et al. teaches that azo dyes (column 20-25) are inherently photo-orientable (column 6, lines 5-15), as taught by Applicant's specification (original claim 6). Although Omelis et al. fails to teach that the photo-orientable material, when oriented, induces an alignment in liquid crystal, it does so inherently, as evidenced by Hikmet.

Hikmet teaches an alignment (orientation) layer (column 2, lines 10-15), which when oriented, induces an alignment of liquid crystals (column 1, lines 20-30), made from a mixture which comprises reactive liquid crystal (column 2, lines 10-20). The reactive liquid crystal has two crosslinkable ethylene groups as seen in Figure 2.



**FIG.2**

***Claim Rejections - 35 USC § 103***

4. Claims 8-10, 12-14, 18, 21-22, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis et al. in view of Schadt et al., as evidenced by Hikmet.

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Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. fails to teach the presence of other dichroic dyes and chiral additives in the polymerizable mixture, and to disclose the liquid crystalline phases of the liquid crystal monomer.

Schadt et al. teaches a polymerizable mixture of cross-linkable liquid crystal monomer (column 3, lines 40-45) which has acrylate or diacrylate components (column 15-30) in the formation of a hybrid layer which is optically anisotropic (column 3, lines 45-55).

Regarding claims 13-14, 24, dichroic dyes are added to provide the function of an optical dichroic filter, polarizer or polarized light emitter (beam splitter) (column 5, lines 10-15).

Regarding claims 12, 24, chiral molecules are added to make an optical cholesteric (LC phase) filter or retarder (column 5, lines 20-25).

Regarding claims 8, 10, Schadt et al. teaches the use of liquid crystals with nematic phase (twisted nematic effect) and with ferroelectric phase (ferroelectric effect) in order to obtain the respective electro-optical effects (column 7, lines 45-55), all of which are well known.

Regarding claim 18, conductive substrate (electrode layer) carries a layer of the polymerized mixture in an STN cell (column 7, lines 50-60).

Regarding claims 21-22, Schadt et al. teaches an optical component wherein the film of crosslinked liquid crystal monomers has varying local orientation of the liquid crystal monomers

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(column 10, lines 20-25). A layer polymerized with a preferred orientation direction is notoriously well known in the art.

Therefore it would have been obvious to one of ordinary skill in the art to have used the teachings of Schadt et al. in the invention of Omelis in order to obtain the desired electro-optical effects.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis et al. in view of Akashi, as evidenced by Hikmet.

Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. however fails to teach the presence of fluorescent molecules.

Akashi et al. teaches a liquid crystal display device (abstract) wherein the liquid crystal layer contains fluorescent molecules (dyes) to improve light scattering properties (column 5, lines 55-60).

Therefore it would have been obvious to one of ordinary skill in the art to have used fluorescent additives in the polymerizable mixture of Omelis et al. in order to obtain an optical element with the desired light scattering anisotropy, as taught by Akashi et al.

6. Claims 23, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis et al. in view of Ichimura et al., as evidenced Hikmet.

Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i)

a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. fails to teach that the polymerized layer has the function of an orientation layer as well as the function of a polarizer.

Ichimura et al. has a polarizer (polarizing element) having photoactive molecules containing at least one double bond selected from non-aromatic (vinyllic) C=C and non-aromatic N=N (column 2, lines 51-56). Irradiation by linear polarized light causes a molecular axis orientation change. Azo dye molecules such as azobenzene are examples of the photoactive molecules (column 4, lines 15-20).

The polarizer is polymerized (baked) with locally varying preferred orientation directions (irradiated with linear polarized lights different in axis of orientation at the time of baking) (column 16, lines 10-20). The polarizer has the additional function of an orientation layer since a dichroic molecular layer formed on the photoactive layer is anisotropically oriented (aligned) (column 2, lines 1-15).

Therefore it would have been obvious to one of ordinary art to have provided the polymerized layer of Omelis et al. with the function of an orientation layer as well as a polarizer, as taught by Ichimura et al.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.



***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications


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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

Sow-Fun Hon

06/30/04

  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

7/1/04